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Original Article

Vocal Cord Paralysis Following Section of Rami Communicans Vagoglossopharyngeal for Pharyngalgia and Otalgia

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Abstract A 46-year-old man experienced severe lancinating pain in the throat that radiated to the left ear. The pain, which was exacerbated by swallowing or coughing, had lasted for 2 years. The findings of the patient's neurological examination were normal. Computed tomographic and magnetic resonance imaging scans of the brain and nasopharynx did not show any abnormality. A diagnosis of idiopathic vagoglossopharyngeal neuralgia was made. In surgery, both the glossopharyngeal and the rami communicans between the vagal and grssopharyngeal nerves were sectioned. The patient was free of pain following the surgery, but complained of hoarseness in voice. Examination showed paralyzed left vocal cord at a paramedian position. In the 12 months following the surgery, the hoarseness has gradually improved and eventually disappeared.

Key words vagoglossopharyngeal neuralgia; hoarseness; surgery

Between 2001 and 2003, 8 cases of glossopharyngeal neuralgia were treated with intracranial section of the glossopharyngeal nerve or glossopharyngeal nerve plus upper vagal rootlets at the Department of otorhinolaryngology, Yueyang Hospital of Traditional Chinese & Western Medicine, with satisfying results. Post-operative hoarseness occurred in one case that lasted for 12 months. This case is reported below.

Case report

A 46-year-old man experienced severe lancinating pain in the throat that radiated to the left ear. The pain, which was exacerbated by swallowing or coughing, had lasted for 2 years. The pain could not be controlled with carbamazepine at 1600 mg per day and ultimately forced the patient to stop working. Computed tomographic and magnetic resonance imaging scans of the brain and nasopharynx did not show any abnormality. The findings of the patient's neurological examination were normal. After transient, complete relief of the pain with cocainization of the tonsillar fossa during a pain attack, a diagnosis of idiopathic vagoglossopharyngeal neuralgia was made, and the patient was referred for surgical treatment.

After the patient was positioned in the left lateral oblique ("park-bench") position under general anesthesia, the ninth and tenth cranial nerves were exposed through a retrosigmoid craniotomy. There was a compression of tenth cranial nerves by the arteriae basilaris near the Pons. Rami communicans (rootlets of the upper vagal nerve) between the ninth and tenth cranial nerve were visualized (figure 1) and sectioned, followed by sectioning of the glossopharyngeal nerve (figure 2).

The patient was free of pain following surgery. He did complain of hoarseness, with no dysphagia or coughing. This was initially thought to be a result the vocal cord injury from endotracheal intubation, and the

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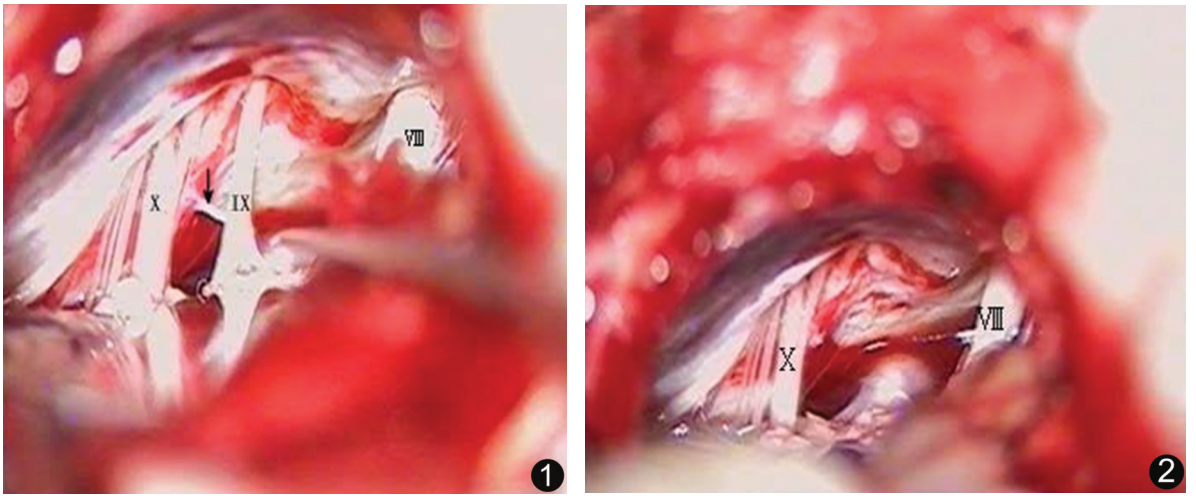

Figure 1. Exposure of cranial nerves and rami communicans. Ⅸ Glossopharyngeal nerve, Ⅹ Vagal nerve, "↓" rami communicans Vagogrossopharyngeal, Ⅷ Vestibulcochlear nerve; **Figure 2.** Following section of rami communicans Vagogrossopharyngeal and Glossopharyngeal nerve, Ⅹ Vagal nerve, Ⅷ Vestibulcochlear nerve

patient was treated with gentamicin and dexamethasone inhalation for 5 days with no effects. Subsequent examination revealed a uvula at the midline with normal and symmetrical palatal movement. The left vocal cord, however, was found to be fixed in a paramedian position. In the following 12 months, the hoarseness gradually improved and eventually disappeared.

Discussion

Since it was advocated by Adson in 1922 and popularized by Dandy in 1927, intracranial section of the glossopharyngeal nerve proximal to the superior ganglion of Andersch became a popular surgical treatment for glossopharyngeal neuralgia. Because of frequent pain recurrance, most surgeons later added an upper vagal rhizotomy during the procedure, with good lasting pain relief [1, 2]. Theoretically, section of the glossopharyngeal nerve can result in loss of taste (especially bitter flavors) in the ipsilateral posterior third of the tongue, loss of tactile and thermal sensations of the posterior pharynx and soft palate, loss of ipsilateral gag reflex, sense of dryness in the mouth, and paralysis of the stylopharyngeus muscle. Section of the upper portion of the vagus nerve can increase the pharyngeal sensory deficit and cause sensory loss in the ear and paralysis of the ipsilateral vocal cord and deficit of the motor arc in gag reflex. However, most patients who undergo sectioning of the glossopharyngeal and rostral vagal rootlets tolerate the procedure well and rarely have any subjective symptoms.

Surgical sectioning of the rami communicans vagoglossopharyngeal in seeking lasting pain relief while trying to avoid complications in swallowing or vocal cord paralysis is a challenge. The decision to section the rostral vagal rootlets and the number of rootlets to section in the treatment of glossopharyngeal neuralgia has been based primarily on studying each individual patient's local nerve anatomy during the procedure. Dandy (1) advocated sectioning the upper one-sixth to one-eighth of the vagal rootlets. Rhoton (3) recommended cutting fewer vagal rootlets if the upper ones were larger in diameter than the lower ones and more if they were smaller (diameter range, 0.1 to 1.5 mm). Tarlov(4) sectioned either the upper two rootlets or upper third of the vagal rootlets (whichever greater in diameter). Taha(5) monitored vagal nerve function intraoperatively through a recording electrode inserted in the ipsilateral false vocal cord to help minimize vocal cord paralysis.

However, if the surgeon does not want to undertake the risk of a recurrence, sensory rhizotomy of the ninth and tenth cranial nerves can be performed with minimal trouble and minor side effects (6). The patient should be imformed that intracranial section of the rami communicans(glossopharyngeal and upper vagal rootlets) for the treatment of glossopharyngeal neuralgia may cause vocal cord paralysis or dysphagia from injury to the motor vagal rootlets. Making the patient fully recognize the risks associated wtih intracranial section of the rami communicans,helps minimize unnecessary medical/legal disputes.

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